

Handout #10: Criminal Law Basics

Review

1. Differences from Civil Law

- Crime requires intent (guilty mind, *mens rea*) except for cases of criminal negligence.
- Criminal cases are brought by the government, so don't require a living victim.
- Crime harms society as a whole in addition to private citizens, allowing for the possibility of "victimless crimes."
- Criminal law requires a higher standard of proof:

$$\underbrace{\text{Beyond a Reasonable Doubt}}_{\text{Criminal Cases}} > \underbrace{\text{Clear and Convincing Evidence}}_{\text{Punitive Damages}} > \underbrace{\text{Preponderance of the Evidence}}_{\text{Civil Cases}}$$

This is because the costs of errors are likely much higher in criminal cases.

- Punishment can be punitive and destructive (instead of compensatory): This is "ex-post inefficient."
- Purpose of criminal law is to prevent all crimes, not just the inefficient ones.

2. Why Criminal Law?

- Cooter and Ulen give the following guide for determining punishment:
 - Acts should be punished when our aim is deterrence and priced when our aim is internalization.
 - Aim should be deterrence when (1) perfect compensation is impossible, (2) people want law to protect rights instead of interests, or (3) enforcement errors undermine liability.
- So Criminal Law works better than tort law to deter crime because (1) perfect compensation may be impossible, (2) not all criminals are caught, and (3) criminals may be judgment proof.

3. Deterrence

- Marginal social cost of increased enforcement may be positive (by increasing the number of criminals punished) or negative (by reducing crimes committed and number of criminals punished)
- Optimal punishment sets:

$$(\text{expected punishment}) = (\text{harm to victim}) - (\text{marginal cost of deterrence})$$

- Two effects of harsher punishments: deterrence (less crime because it is more costly to commit) and incapacitation (less crime because criminals are already locked up) make it difficult to test the deterrence hypothesis.
- Empirically, increased probability of being caught has a greater deterrence effect than increased severity of punishment

4. Punishment

- In the U.S., the most common punishment is imprisonment. In addition to deterrence, this has the effect of incapacitating criminals; this added effect is only effective when the supply of criminals is inelastic. Imprisonment tends to be inefficient: putting someone in prison is costly and makes them worse off.
- In Europe, many crimes are punished by fines. Fines are efficient, but create the potential for abuse, since the money must go somewhere.
- In the U.S. the death penalty is extremely expensive due to additional legal safeguards; it's currently more expensive in the United States to execute someone than to imprison them for life.
- Additional punishment for crime: Stigma
 - People don't want to hire convicted criminals; having a conviction on your record is an extra punishment
 - In the absence of wrongful conviction, stigma has negative social cost, since it gives people information about criminals' proclivity to commit crime.
 - However, stigma increases the cost of wrongful conviction, since in this case it gives people bad information. This suggests that criminal cases should have a higher burden of proof than civil ones.

Math Review: Risk

Up to this point, we haven't really cared about the risk preferences of the agents in our models. We've already suggested that risk is important in criminal law, because criminals treat probabilities of punishment and amount of punishment asymmetrically.

Definition. An agent is *risk averse* (*risk-loving*) if for any gamble over potential outcomes —levels of wealth, x — receiving the amount $\mathbb{E}[x]$ with certainty is at least as good as (no better than) the gamble itself. If a decision maker is always indifferent between these two lotteries, we say that they are *risk neutral*. Finally, we say that they are *strictly risk averse* (*strictly risk loving*) if the indifference holds only when the two lotteries are the same.

Mathematically, this is written as:

$$\text{Risk Averse : } \mathbb{E}[u(x)] \leq u(\mathbb{E}[x])$$

$$\text{Risk Loving : } \mathbb{E}[u(x)] \geq u(\mathbb{E}[x])$$

where $u(\cdot)$ is the utility function over wealth.

These two inequalities are well-known properties of certain expectations given by *Jensen's Inequality*, and they have the following implications:

1. An agent is risk-averse if and only if their utility function $u(\cdot)$ is concave in wealth.
2. An agent is risk-loving if and only if their utility function $u(\cdot)$ is convex in wealth.

These inequalities naturally suggests that for a given gamble, there is some amount that the agent is willing to accept with certainty that would make them indifferent between the gamble.

Definition. The *certainty equivalent* of a gamble, denoted c , is the amount of money for which the individual is indifferent between the gamble and the certain amount c ; that is,

$$u(c) = \mathbb{E}[u(x)].$$

Since utility is increasing in wealth, it only makes sense that the certainty equivalent for a risk-averse agent is no greater than the expected wealth level, and the certainty equivalent for a risk-loving agent is no less than the expected wealth level.

We mentioned above that we have been assuming risk neutral agents. That is, we've been assuming that all agents in our models that have utility functions that satisfy:

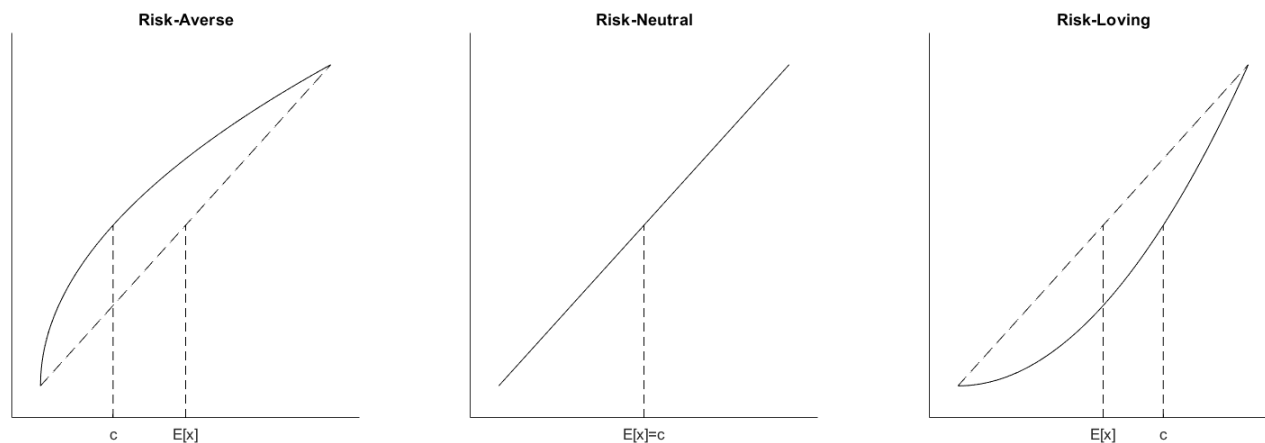
$$\mathbb{E}[u(x)] = u(\mathbb{E}[x])$$

But this is only the case when our agents have utility functions that look like:

$$u(x) = a + bx$$

So you can see just how restrictive the assumptions of our model are.

Example: Suppose that for a certain gamble there are two equally likely wealth levels. The following are graphs of the utility functions and certainty equivalents for the gamble for agents with various risk preferences:



Problems

1. Recall that the aim of criminal law is to minimize the sum of three things: (1) the social cost of the crimes that are committed, (2) the cost of detection, and (3) the cost of trying and punishing the offenders who get caught. Suppose that each crime cost the city of Madison \$10,000 worth of harm. The current police force costs \$2,000,000 and it apprehends 15% of offenders. The total social cost of trials and punishment is \$100,000 per criminal caught. Each year 1,000 crimes are committed.
 - (a) Calculate the social cost of crimes committed.
 - (b) Calculate the cost of trying and punishing offenders.
 - (c) What is the sum of (1) the social cost of the crimes that are committed, (2) the cost of detection, and (3) the cost of trying and punishing the offenders who get caught?

The city of Madison is considering measures to reduce the impact of crimes. Two measures were proposed. Proposal 1 aims to expand the police force to increase detection of criminals. This would raise the cost of maintaining the police force to \$4,000,000 and increase the rate of detection to 20%. This measure would also decrease the number of crimes committed to 700 per year.

 - (d) Calculate the social cost of crimes committed under Proposal 1.
 - (e) Calculate the cost of trying and punishing offenders under Proposal 1.
 - (f) What is the sum of (1) the social cost of the crimes that are committed, (2) the cost of detection, and (3) the cost of trying and punishing the offenders who get caught?

Proposal 2 aims to increase the prison sentence to deter potential offenders from committing crimes. This would raise the cost of trying and punishing offenders to \$135,000 per criminal caught. This measure would also decrease the number of crimes committed to 800 per year.

 - (g) Calculate the social cost of crimes committed under Proposal 2.
 - (h) Calculate the cost of trying and punishing offenders under Proposal 2.
 - (i) What is the sum of (1) the social cost of the crimes that are committed, (2) the cost of detection, and (3) the cost of trying and punishing the offenders who get caught?
 - (j) Which proposal would the city of Madison favor?
2. (From Gary Becker's¹ 1965 Microeconomics Final²) Suppose the traffic department would like to enforce parking regulations in an efficient way. Assume that each person has the choice of parking illegally or legally; the latter costs X dollars per "day" and the former, if one is caught, causes a fine equal to F dollars per time caught.
 - (a) Assume first that the sole aim of the traffic department is to discourage illegal parking at minimum cost. Assume also that all drivers simply try to maximize expected money income. How frequently should the traffic department inspect parking in order to achieve its aim?
 - (b) If all drivers maximized expected utility and had diminishing marginal utility of income, (but there is no utility or disutility from disobeying the law), how would this affect your answer? If they had increasing marginal utility of income?
 - (c) Suppose the traffic department received all the fines and desired just to maximize its expected income. How would your answer to (a) be affected?
 - (d) How does your answer to (a) and (c) depend on F , the size of the fine, and X , the cost of legal parking?
3. (From Miceli (2004): Chapter 9) Consider fines for speeding. Assume that speeders can drive at either 75 mph or 90 mph (the speed limit is 65 mph), and that the probability of being caught at either speed is .01. Also, assume that the maximum possible fine is \$10,000, which is set for driving at 90.
 - (a) Suppose an individual has already decided to speed. Calculate the fine for driving at 75 that will discourage her from increasing her speed to 90 unless her gain from doing so is \$50 or more.
 - (b) Show that the same degree of marginal deterrence can be achieved by setting the fine at \$10,000 for driving at either speed but pulling over those driving at 90 more frequently.

¹No relation.

²Gary Becker plays a pivotal role in the development of the economic analysis of crime, so this is a pretty interesting question (historically speaking). There are no solutions available, so I made them myself; hopefully they'd meet his standards. You can find this question (among others) here: <http://www.irwincollier.com/columbia-microeconomic-theory-exam-becker-1965/>